

Claims:

1. An intraocular lens comprising:
a housing;
an actuator disposed within the housing to separate the housing into first and second chambers;
a first volume of a first fluid having a first index of refraction contained within the first chamber;
a second volume of a second fluid having a second index of refraction contained within the second chamber; and
means coupled to the actuator for altering the first volume relative to the second volume to alter an optical power of the lens.

2. The intraocular lens of claim 1 wherein actuator comprises a flexible transparent layer.

3. The intraocular lens of claim 1 wherein actuator comprises one or more extensible cells.

4. The intraocular lens of claim 1 wherein the means for altering the first volume relative to the second volume comprises a reservoir.

5. The intraocular lens of claim 4 further comprising a haptic that engages a ciliary muscle of an eye and is configured to transmit force to the reservoir.

6. The intraocular lens of claim 1 further comprising a relief reservoir in fluid communication with the second chamber.

7. The intraocular lens of claim 2 wherein the reservoir is coupled to the first volume via a passageway.

8. The intraocular lens of claim 3 wherein the means for altering the first volume relative to the second volume comprises a reservoir in fluid communication with the one or more extensible cells.

9. The intraocular lens of claim 3 wherein the one or more extensible cells act as a fulcrum.

10. The intraocular lens of claim 2 further comprising a fulcrum disposed in contact with the flexible transparent layer.

11. The intraocular lens of claim 10 wherein the fulcrum comprises an annular ring.

12. The intraocular lens of claim 3 wherein the housing comprises an anterior element having a flexible transparent layer.

13. The intraocular lens of claim 12 wherein first index of refraction is the same as the second index of refraction.

14. The intraocular lens of claim 1 wherein the housing further comprises a posterior lens.

15. The intraocular lens of claim 4 further comprising means for controlling flow into and out of the reservoir.

16. A method of adjusting the power of an intraocular lens to provide accommodation, comprising:

providing a lens having a housing, an actuator disposed within the housing to separate the housing into first and second chambers, a first volume of a first fluid having a first index of refraction contained within the first chamber, and a second volume of a second fluid having a second index of refraction contained within the second chamber; and

actuating the actuator to alter the first volume relative to the second volume responsive to contraction of a ciliary muscle to thereby change an optical parameter of the lens.

17. The method of claim 16 further comprising providing a reservoir coupled to the first volume, wherein actuating the actuator comprises moving an amount of the first fluid from the reservoir to the first chamber.

18. The method of claim 17 wherein the lens further comprises a haptic configured to transmit force from the ciliary muscle to the reservoir, wherein moving an amount of the first fluid from the reservoir to the first chamber comprises applying a compressive force to the haptic.

19. The method of claim 16 wherein the lens further comprises a relief reservoir, wherein actuating the actuator comprises moving an amount of the second fluid from the second chamber to the relief reservoir.

20. The method of claim 16 wherein the actuator comprises one or more extensible cells disposed in contact with a flexible transparent layer, wherein actuating the actuator comprises actuating the one or more cells to deflect the flexible transparent layer.

21. The method of claim 20 wherein the flexible transparent layer comprises an anterior surface of the housing having a curvature and the first index of refraction is the same as the second index of diffraction, wherein actuating the actuator comprises actuating the one or more cells to deflect the flexible transparent layer to alter the curvature of the anterior surface of the housing.

22. The method of claim 20 wherein the lens further comprises a reservoir coupled to the one or more extensible cells, wherein actuating the one or more extensible cells comprises moving an amount of a third fluid from the reservoir to an interior or the one or more extensible cells.

23. The method of claim 20 wherein actuating the one or more extensible cells causes the flexible layer to deflect with the one or more extensible cells acting as a fulcrum.

24. The method of claim 16 wherein the actuator comprises a flexible transparent layer, the method further comprising providing a fulcrum disposed in contact with the flexible transparent layer and wherein actuating the actuator comprises deflecting the flexible layer while maintaining a fixation point at the fulcrum.